

Applicant : Richard C. Walton et al.
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REMARKS

The claims have been amended to correct the noted informalities. Claim 2 has been clarified that it relates to a product suitable to be wetted by the user.

The independent claims call for a wipe product in which the nonwoven web is in a "permanent dry-creped, heat-set" condition, the constituent heat-set thermoplastic fibers significantly preserving the creped structure of the web during presence of a wet agent. The preserved ridge and groove structure, claims 1 and 23, provides stress-concentrating wiping edges, and the preserved volume-enhanced structure, claims 2 and 24, facilitates the wipe carrying a significant quantity of liquid.

The heat-set condition of the dry-creped thermoplastic fibers is vital to this product. As referred to in the industry, a thermoplastic fiber is in "heat-set" condition after it has been raised to deformation temperature of its resin in the presence of stress and strain on the fiber, followed by conventional cooling. The greater the stress and strain imposed on a thermoplastic fiber at heat-set temperature, the greater is the distortion preserved in the heat-set fiber. In the present specification, polyester fibers reach heat-set condition under creping stress by heat conducted from a web-engaging creper surface heated above 350F. For heat-setting polypropylene fibers, the engaging surface is above 250F.

If a web were to contain significant water during creping, there would be heat absorption by the relatively low boiling point water that would prevent the thermoplastic fibers reaching heat-set condition while creping forces are applied. On the other hand, delaying an attempt to heat-set to a stage after creping would be of doubtful value because of relaxation of stress on the target fibers. This is especially so of a dry-creped web, which when released from creping stress, tends to spring back towards original form.

The term "dry-crepe" refers to creping a web "without the web being adhesively adhered to a surface (as in a Yankee dryer)", page 2, lines 7, 8 of the present specification. Dry-crepe is made possible by a surface pressing dry incoming web into driven engagement with a

mechanically gripping surface of a drive roll. The drive roll propels the dry material against a retarded pile of the material, against which it collapses to form the dry-crepes.

To produce the products of page 17 of the specification, the driving roll of the creper of Fig. 12 was heated to 365°F for webs with polyester thermoplastic fibers and 270°F for webs with polypropylene thermoplastic fibers. Because the thermoplastic fibers were at deformation temperature when subjected to the stress and strain of creping, the crepe deformation of the thermoplastic fibers was captured by heat-set to preserve the ridges and grooves and of the volume-enhanced web structure of the wipe product when wet.

In the Office Action of January 11, 2005, the principal reference is Wang et al. (U.S. Patent No. 5,935,880).

Claims 1-2, 8-18, 20-24 and 48-53 were rejected under Section 102(b) as being anticipated by Wang et al., claims 3-7 were rejected under Section 103(a) as being unpatentable over Wang et al. and claim 19 was rejected under Section 103(a) as being unpatentable over Wang et al. in view of Srinivasan et al. (U.S. Patent No. 5,500,281).

Wang et al. is directed to a wiping product that will “disperse in an aqueous environment into unrecognizable pieces”, i.e. disintegrate, to be flushed down a toilet.

The Wang et al. product was not in dry-creped state. In the course of forming the product “a binder composition is added to the web”, column 6, line 21. A “typical method for adding the binder to the web is...an aqueous mixture of the binder...”, col.6, l. 62,63. The web is then creped by a process such as described in U.S. 4,894,118, by creping from a dryer drum by a doctor knife, column 7, lines 13-21. The patent referred to by Wang et al., U.S. 4,894,118, describes creping from a “cylindrical dryer 28 such as a Yankee dryer”, see column 1 line 67 of '118, care being taken to “insure proper adhesion between the web and the dryer”, column 2, line 19 of '118. The crepe formed by Wang et al. is thus wet crepe, not “dry-crepe” defined on page 2, lines 7, 8 of the present specification.

Synthetic fibers in the web were *merely optional* for Wang et al. Wang et al. says “It is preferable, although not required, that a synthetic fiber material in a concentration range of from

about 0% to about 30%, more preferably up to about 5%, be mixed with the pulp.....", column 4, lines 30-38. Furthermore, thermoplastic fibers, only optionally present in a web of Wang et al., were not disclosed as being heat-set during creping or at any time during the described process.

The Wang et al. reference to "cure" related to something very different. The binder applied by Wang et al. is a cross-linkable terpolymer, column 6, lines 21-38. Following applying an aqueous mixture of this binder and creping one side, the binder is applied to the other side and the product is recreped in similar fashion. Only, "After the recreping the web is dried completely or cured", column 7, line 30,31. In the two Wang et al. examples, at final processing, "[T]he recreped web was then dried completely", column 10, line 59 and column 11, line 41-44.

We submit that the term "cured" or "cure" in the essential step of "dried completely or cured", or "full dry or cure" of Figs. 1 and 2 of Wang et al., refers to conventional curing of the terpolymer cross-linkable binder. Since thermoplastic fibers might not even be present, there is nothing to suggest that "curing" relates instead to achieving deformation temperature to heat-set thermoplastic fibers. Even if the Wang et al. reference to "cure" were considered not to relate to cross-linking the binder, the next best understanding of the Wang et al. usage of the term would be as an alternate way of describing mere drying, to which the examples are limited: "The recreped web of step F was then dried completely...", Wang et al. column 10, line 59.

We note again that for Wang et al., presence of thermoplastic fibers is not required, and when present, preferably it was at a percentage less than 5% (inadequate for applicants' purpose.) There is no disclosure in Wang et al. of heat-set, dry-creped thermoplastic fibers of a wipe that preserve dry-creped structure in the presence of a wet agent. Indeed, there is no fair suggestion in Wang et al., of heat-setting constituent thermoplastic to any degree, nor at any stage.

Wang et al. was rather aimed in the opposite direction, of disintegration of a wipe under certain wet conditions.

To support rejection of claims 1-2, etc., as being anticipated by Wang et al., the Office Action says that Wang et al. discloses, among other things "the nonwoven web is in a permanent,

dry-creped (column 7, lines 13-21), heat-set (cured; column 7, lines 30-33) condition.” Further, the office action says “With regard to the claimed aspect of the web having been heat-set during the imparting of ridges, the structural limitation of the claims fall within the limitation of Wang et al. as discussed above. The method of making the web is given little patentable weight”.

Applicants respectfully submit, for the reasons explained above, that:

- (1) Wang et al. does not describe a wipe comprising a nonwoven web in a dry-creped state;
- (2) The Wang et al. reference to “cure” is not directed to heat-setting the form of thermoplastic fibers since the fibers might not even be present, or if present, most likely in inadequate quantity;
- (3) The Wang et al. “drying or curing” occurs after its crepe would have had opportunity to relax from its stressed condition which would be relatively ineffective for a dry-creped web; and
- (4) Wang et al. does not fairly disclose form-preserving heat-set dry-creped thermoplastic fibers in a wipe web.

For these reasons, we submit Wang et al. does not anticipate the invention of independent claims 1, 2, 23 and 24 or the dependent claims, nor would Wang et al. alone or in combination with other art of record make any of them obvious to one of ordinary skill.

Early favorable return is therefore solicited.

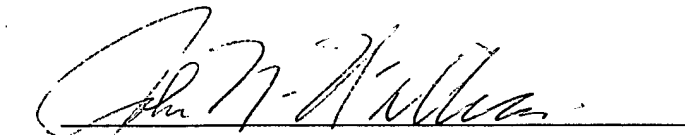
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Respectfully submitted,

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